

Date: Sat, 19 Feb 94 04:30:55 PST
From: Ham-Homebrew Mailing List and Newsgroup <ham-homebrew@ucsd.edu>
Errors-To: Ham-Homebrew-Errors@UCSD.Edu
Reply-To: Ham-Homebrew@UCSD.Edu
Precedence: Bulk
Subject: Ham-Homebrew Digest V94 #35
To: Ham-Homebrew

Ham-Homebrew Digest Sat, 19 Feb 94 Volume 94 : Issue 35

Today's Topics:

 Car power jack
 Frequency doubler design, help, VF0
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 Good substitute for 1N23 as noise source? (2 msgs)
 homebrew SSB xtal filters
 RF Power Amp stages, design. Help needed!
 Valvo GmbH
 VHF Lo/High Bander-possible?
 WANTED: Phil Karn's KA9q functions in C
 What test equipment do you use? (2 msgs)

Send Replies or notes for publication to: <Ham-Homebrew@UCSD.Edu>
Send subscription requests to: <Ham-Homebrew-REQUEST@UCSD.Edu>
Problems you can't solve otherwise to brian@ucsd.edu.

Archives of past issues of the Ham-Homebrew Digest are available
(by FTP only) from UCSD.Edu in directory "mailarchives/ham-homebrew".

We trust that readers are intelligent enough to realize that all text
herein consists of personal comments and does not represent the official
policies or positions of any party. Your mileage may vary. So there.

Date: Thu, 17 Feb 94 14:45:09 GMT
From: netcon!bongo!netcomsv!skyld!jangus@locus.ucla.edu
Subject: Car power jack
To: ham-homebrew@ucsd.edu

In article <u*&@byu.edu> CROFTW@caedm.et.byu.edu writes:

>
> I want to build a car power adaptor (cigarette lighter type) for a kenwood
> 28A. A friend of mine has one he bought that says it is filtered. Do I need
> to do anything other than put a couple of capacitors in parallel with the 12V
> leads??
>

The "store bought" plug in adaptors have a nice inductor in series with the DC supply to the HT. This serves two purposes, it eliminates the whine of an alternator system, and it stops any spikes from getting to the HT (When used with a large electrolytic at the HT side).

Made all the difference with my Kenwood TH-77A handheld in the truck.

Amateur: WA6FWI@WA6FWI.#SOCA.CA.USA.NA		"You have a flair for adding
Internet: jangus@skyld.grendel.com		a fanciful dimension to any
US Mail: PO Box 4425 Carson, CA 90749		story."
Phone: 1 (310) 324-6080		Peking Noodle Co.

Date: Fri, 18 Feb 1994 16:53:13 GMT
From: agate!howland.reston.ans.net!usc!yeshua.marcam.com!news.kei.com!
ssd.intel.com!rlt@network.ucsd.edu
Subject: Frequency doubler design, help, VFO
To: ham-homebrew@ucsd.edu

In article 1834 of rec.radio.amateur.homebrew
Daniel writes:

> the 1994 ARRL Handbook and they work. But when I use the VFO with
> the freq. doubler circuit from the September 1993 issue of CQ,
> I found the output to be too weak and fundamental frequency rejection
> is insufficient.

> this and/or is there a more suitable means of deriving 20 m from a
> 40 m VFO?

73 de 9V Daniel

I do not have the circuit mentioned in 93 issue of CQ available to me. However, I have used other circuits to great success. Both may be found in Solid State Design by Hayward and DeMaw. One is a broadband diode doubler that is extremely simple and works at any hf frequency. However, it does require a fair amount of drive. (about +10dBm? can't remember) Even with randomly chosen diodes in the doubler, I have seen 30+ dB rejection of the driving waveform.

The other doubler is very similiar, but uses transistors instead of diodes. It also requires plenty of drive unless the transistors are biased on slightly. Then it is easy to drive. 0 dBm will drive it just fine. It also has good rejection of driving waveform. If you use dual transistors or at least two transistors on a single die (eg CA3028,

or CA3049T) even greater driving waveform rejection can be had. Last night I saw about 45dB rejection of a 7MHz driving source while doubling to 14 MHz.

The transistor type doublers are usually shown with a resonant tank circuit in the collector circuit tuned to the 2x frequency. However I have found that the same circuit can operate well at a broadband doubler by substituting a 50uH choke in the collector circuit. You must however at some point filter out all the harmonics except for the second. A great advantage of this circuit is that the odd harmonics are greatly suppressed thus there are 2 octaves of bandwidth between even harmonics which relaxes filtering requirements.

Hope this helps. Oh yeah, also see: Accessories for your VFO, Jan 1988, QST.

Best wishes,

Roger Traylor

--

Roger Traylor
rlt@ssd.intel.com
Intel Corporation - Supercomputer Systems Division
Beaverton, OR 97006

Date: 18 Feb 1994 10:24:21 GMT
From: swrinde!cs.utexas.edu!math.ohio-state.edu!jussieu.fr!univ-lyon1.fr!
elendir@network.ucsd.edu
Subject: Frequency doubler design, help, VFO.
To: ham-homebrew@ucsd.edu

Alan Bloom (alanb@sr.hp.com) wrote:
: asirene@ntuvax.ntu.ac.sg (asirene@ntuvax.ntu.ac.sg) wrote:

: I'm not familiar with either the VFO or doubler design, but how about
: this idea: Build another VFO, but with all the frequency-determining
: coils and capacitors 1/2 the value. You would end up with a VFO that
: tunes 14-14.6, assuming the 40 meter version tunes 7-7.3. You could
: reduce the tuning capacitor size even further (i.e. make it about 1/4
: the size instead of 1/2) to reduce the tuning range.

That is a solution, but does not take into account how the transistor acts versus the frequency.

The idea behind a frequency multiplier is the same as a class C amplifier. I mean, you take the output from the VCO, and feed it into a small-signal

class C (typically a transistor with emm. grounded, or better a FET, because FET are known to show only quadratic behaviour), whose output is connected to a parallel LC network (or ceramic filter, or whatever) tuned at the second harmonic. That should give you a neat output.

73 from France,
Vince (11.5 weeks and waiting)

Date: 17 Feb 1994 15:51:22 GMT
From: library.ucla.edu!agate!howland.reston.ans.net!europa.eng.gtefsd.com!
news.msfc.nasa.gov!news.larc.nasa.gov!grissom.larc.nasa.gov!
kludge@network.ucsd.edu
Subject: Good substitute for 1N23 as noise source?
To: ham-homebrew@ucsd.edu

In article <3412@grivel.une.edu.au> smattila@metz.une.edu.au (Sakari Mattila) writes:

>
>1N23 is point-contact diode, sensitive to static electricity,
>even to RF fields, Vr is something like 5 V or even less. It
>goes up to 10 GHz. I have not seen any explanations about the
>material, I guess it is silicon diode.

It's a germanium diode, actually.

I don't have any in the junk box, but I have a few 1N22Bs, and some weird Monsanto MV4 diodes, as well.

--scott

--

"C'est un Nagra. C'est suisse, et tres, tres precis."

Date: 18 Feb 94 15:20:36 GMT
From: library.ucla.edu!csulb.edu!nic-nac.CSU.net!usc!howland.reston.ans.net!
vixen.cso.uiuc.edu!moe.ksu.ksu.edu!cis.ksu.edu!mac@network.ucsd.edu
Subject: Good substitute for 1N23 as noise source?
To: ham-homebrew@ucsd.edu

smattila@metz.une.edu.au (Sakari Mattila) writes:

>The 1N23 is a very special diode. Its old like heck, but still
>vide used and difficult to find. Try Nebraska Surplus Sales, he
>will sell you even one diode.

My junque box once had an even dozen of them.

If someone needs one, send email and we can probably work something out. Too bad they can't be sent via the Internet!

--Myron.

--

Five boxes preserve our freedoms: soap, ballot, jury, witness, and cartridge.
Myron A. Calhoun, PhD EE; Assoc. Professor (913) 539-4448 home
INTERNET: mac@cis.ksu.edu 532-6350 work, 532-7353 fax
UUCP: ...rutgers!depot!mac Packet radio: W0PBV@N0ARY.#NOCAL.CA.USA.NA

Date: Sat, 19 Feb 1994 03:30:45 GMT
From: agate!howland.reston.ans.net!cs.utexas.edu!sdd.hp.com!col.hp.com!srigenprp!
alanb@network.ucsd.edu
Subject: homebrew SSB xtal filters
To: ham-homebrew@ucsd.edu

James G Larsen (jimla@tekig1.PEN.TEK.COM) wrote:

: Has anyone built a ladder filter for SSB using cheap crystals? My
: Digi-Key catalog has a wide selection from 3.579 MHz to 60 MHz for
: \$1.00 - \$1.50 each. How many crystals are needed for 30-40 dB sideband
: supression?

I have built CW filters, but not SSB filters. I found that my filter with 4 crystals gave better ultimate rejection (far from the center frequency) than the 8-pole filter that came with the radio. Ultimate rejection is more a function of shielding and grounding (to avoid leakage around the filter) than of the number of crystals.

That may not answer your question, however, since sideband suppression requires close-in rejection. I still bet you could get 30-40 dB with 4 poles.

AL N1AL

Date: Sat, 19 Feb 1994 04:32:01 GMT
From: agate!howland.reston.ans.net!newsserver.jvnc.net!raffles.technet.sg!ntuix!
ntuvax.ntu.ac.sg!asirene@network.ucsd.edu
Subject: RF Power Amp stages, design. Help needed!
To: ham-homebrew@ucsd.edu

Hi,

I'd like to know what considerations are required to modify an existing HF RF Power stage to a higher power without needing to actually build a separate HF linear amp. Specifically I'd like to know if it is possible to drop a different transistor into place and change the current limiting resistor of the final stage, provided the transistor is carefully selected, and get an increased power output? What about the driver stage? Is the output of the driver stage critical as I see in the catalog, it appears that some of these transistors come with a specified input power, eg: 0.1 watt in/ 15 watt out/ Ppe 23 dB. What exactly is the Ppe? Another thing about transistor selection, will a VHF transistor work well in a HF circuit? For example, the specs above are for the MRF 261 transistor which is actually a VHF transistor, will this work in a HF power stage then? More specifically I am trying to modify the output of the ARK 20 QRP transceiver from about 3 watts to say 12-20 watts or so. How difficult will the change in design be? The reason I am thinking of this is that I want to keep the QSK active rather than have a separate QSK TR switch for the additional linear amp.

Tks for any advice.

73 de 9V Daniel

Date: Thu, 17 Feb 1994 18:31:17 GMT
From: library.ucla.edu!europa.eng.gtefsd.com!howland.reston.ans.net!pipex!uknet!
bcc.ac.uk!link-1.ts.bcc.ac.uk!ucgapam@network.ucsd.edu
Subject: Valvo GmbH
To: ham-homebrew@ucsd.edu

Hello.

I am looking for 2 radio frequency transistors.

BFW60D and BFR35A

They are apparently made by a company in Germany called Valvo but I have not been able to learn anything else about them.

Does anyone know the address or phone number of Valvo, or of a supplier of these 2 components.

Thanks for your help.

Patrick

patrick@anatomy.ucl.ac.uk

Date: 18 Feb 1994 05:38:37 GMT
From: swrinde!cs.utexas.edu!howland.reston.ans.net!math.ohio-state.edu!caen!
saimiri.primate.wisc.edu!news.crd.ge.com!sarah!rpi!wildeb@network.ucsd.edu
Subject: VHF Lo/High Bander-possible?
To: ham-homebrew@ucsd.edu

I've been told its impossible, and I've been told it will just take a little work. What I'm looking for is a radio (preferably handheld, but mobile would be fine), that can transmit and recieve on VHF lo band and VHF Hi band. While VHF/UHF is common, I was wondering if anyone knew how to modify a radio to do this, or where to get one, or where to look for more info. I ride on several fire departments and ambulances (between home and college), and home operates on Lo-band, and at school, we use Hi-band.

Any suggestions would be appreciated.

-73's
-Brian Wilde
-N2OWD

Date: 19 Feb 94 06:11:11 GMT
From: agate!howland.reston.ans.net!wupost!waikato!auckland.ac.nz!aukuni.ac.nz!
kiwi!clark@ames.arpa
Subject: WANTER: Phil Karn's KA9q functions in C
To: ham-homebrew@ucsd.edu

gcouger@olesun.okstate.edu (Gordon Couger) writes:
: I want to control my Icom 735 with an msdos computer. I have Phil Karn's
: KA9q functions in C. But I can't find the first part of the 2 files to
: see how he made his contctions from the printer port to the Icom.

Would anyone out there have Phil Karn's _complete_ KA9q functions in C?
If they are not too massive, could they email them to me or tell me the name
of a site where they may be ftp'd? (Not that I have ftp access :-()

Many thanks for any pointers and regards from down under... clark

--
Email: clark@kiwi.gen.nz (Clark R F Mills) -----+-----+
Voice: 64-25-935002 Disclaimer: All errors are | \$ nice -20 work & |
Fax : 64-9-8494282 line niose! | \$ exec games |
Snail: P O Box 47-195, Ponsonby, Auckland, New Zealand +-+-----+-----+

Date: 18 Feb 1994 14:49:27 GMT
From: library.ucla.edu!europa.eng.gtefsd.com!news.msfc.nasa.gov!
news.larc.nasa.gov!grissom.larc.nasa.gov!kludge@network.ucsd.edu
Subject: What test equipment do you use?
To: ham-homebrew@ucsd.edu

In article <CLEK91.CA6@srigenprp.sr.hp.com> alanb@sr.hp.com (Alan Bloom) writes:
>

>Must have: Multimeter (volts/ohms/amps), power supply (preferably
>adjustable voltage), the usual hand tools.

Yup. I'll say, though, that you will eventually find that you need several power supplies. I have four little HP supplies, a 5A 0-40V Tracor supply, and a 100V-600V homebrew supply, and I am always finding that I need something that I don't have. I still have to keep boxes of batteries around.

>Very nice to have: Audio signal generator/function generator,
>RF signal generator(s), frequency counter, cheap oscilloscope, variable-
>voltage AC transformer (Variac), logic probe, grid-dip oscillator.

Don't forget the VTVM! I strongly recommend one of the cheap DVMs which have a thousand functions on them, mostly because they have a high enough input impedance to make a VTVM pretty much superfluous. (In addition, some of the weird DVM features can turn out to be handy).

I have to admit that the feature I use most on my DVM is the continuity tester that beeps when it finds less than ten ohms between the contacts. It's been incredibly useful for reverse-engineering equipment where huge harnesses of non-color-coded wires disappear into the chassis and come up in some unknown place.

There are also some non-usual hand tools that go in this category, like a few riffler files, a good set of chassis punches, hemostats and dental picks for soldering, and maybe a couple of different soldering irons. A temperature-controlled iron is very nice to have, but you will also need a 75W or so iron for working on tube gear, and a cheap propane torch for soldering ground lugs and building antennae.

>Nice to have, but probably too expensive: Spectrum analyzer,
>impedance bridge, sweep oscillator/network analyzer, digital oscilloscope,
>logic analyzer, transistor parameter analyzer, IC tester, tube tester (:=)

The third list contains some interesting items, some of which ought to be in the "must have" range if you are doing particular work, but which are

specialized enough not to be needed for a lot of things.

The impedance bridge, for example, is pretty much crucial. I don't know how I survived without one. You also ought to have a capacitance tester which can check for ESR and leakage, although a lot of general-purpose bridges will do the job nicely.

Personally I find digital oscilloscopes a pain in the neck for most things. For non-repetitive waveforms, and finding just that one pulse, they are wonderful, and for digital work they are very useful. For radio stuff, though, I'd rather just have a good storage scope, and good storage scopes turn up cheaply on the surplus market now and then.

Also, I think a good narrowband AF spectrum analyzer is great to have along with an RF spectrum analyzer, but then I do a lot of audio work. If you don't have an RF spectrum analyzer, you can probably get by with a good communications receiver to search for spurs and harmonics.

Oh yes, and if you work with tubes, you need a tube tester. If you don't, don't bother. I've never found the IC testers very useful except in a production environment, though.

Don't forget, though, a good set of microwave gear, if you ever work up in those bands. I've got an ancient X-band test set with an oscillator and a power meter in a box. Again it's essential if you do any work in the band, and a clunky waste of space in the garage if you don't.

There's also some mechanical gear that is handy to have, like a drill press, a lathe, and (if you are really insane) a mill. I've had to make my own heliax flanges on short notice and found a lathe to be incredibly handy.

In the way, way too expensive range, I want an HP modulation domain analyzer, an FFT analyzer (I would settle for the Ono Sokki model), maybe a signal analyzer like the HP 89410A (we're really dreaming here), and the like. Oh yes, and more and bigger power supplies.

--scott

--

"C'est un Nagra. C'est suisse, et tres, tres precis."

Date: Sat, 19 Feb 1994 05:26:58 GMT

From: agate!howland.reston.ans.net!usc!sdd.hp.com!hpscit.sc.hp.com!icon!
lkraft@ames.arpa

Subject: What test equipment do you use?

To: ham-homebrew@ucsd.edu

Alan Bloom (alanb@sr.hp.com) wrote:

```

: >
: > Have you ever used an HP546XX-series scope? I, like you, was a dyed-in-the-
: > wool digital oscilloscope hater until I used one of those. I liked it so
: > much I bought one for home (at employee discount :=). They did a really
: > great job of making it "look and feel" just like an analog scope while
: > retaining the advantages of a digital scope.
: >
: > AL N1AL
: > (No, I don't get a commission :=)
: >

```

Not only that, but you can get a plug-on module that lets the 54600/1 behave as a spectrum analyzer. Works best on steady-state signals, but I've found it useful up through the tens of MHz range. It's great for tweaking audio stuff.

For most lower frequency (<100MHz) stuff, it does a pretty good job of measuring frequency, voltages, etc. I don't even own a good multimeter but have been able to build and debug a few advanced projects using the scope instead. And when you get bored it will play Tetris! :-)

73,
L

```

=====
                                     Lyle Kraft                AA6LK
                                     Hewlett-Packard
##### / _ _ #####
##### / / _/ #####
##### / / _/ #####
##### / / _/ #####
##### / / _/ #####
                                     916-785-5798
                                     lkraft@core.rose.hp.com
=====

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End of Ham-Homebrew Digest V94 #35
